

## SECTION 02951

### HIGHWAY AND RAILWAY CROSSINGS

#### PART 1 - GENERAL

##### 1.1 SCOPE

The work covered by this section includes furnishing all labor, materials, service, and equipment required to properly complete sewer and/or force main pipeline construction under federal, state highways, county roads and city streets and railroads as described herein and/or as shown on the Drawings. All work to be performed shall meet the Utility Manual of the respective Highway Department in effect at the time of the construction and be in accordance with the American Railway Engineering Association (AREA), Specifications Part 5 (Pipelines) and the railroad affected.

##### 1.2 SHOP DRAWINGS AND ENGINEERING DATA

Complete engineering data and product information shall be submitted to the Engineer in accordance with the requirements of the section entitled "Submittals" of these Specifications.

##### 1.3 STORAGE AND DELIVERY

All materials shall be stored and protected with strict conformance to the manufacturer's recommendations and as approved by the Engineer.

##### 1.4 INSURANCE

Certificates of public liability and property damage insurance showing the Railway as the certificate holder shall be furnished by the Contractor at no additional cost to the Owner.

#### PART 2 - PRODUCTS

##### 2.1 MATERIALS

A. Steel casing pipe shall be spiral or straight seam welded steel pipe conforming to ASTM A 139 Grade B of the latest standard specifications. Minimum pipe wall thickness shall be as follows:

|                      | <u>Highway</u> | <u>Railroad</u> |
|----------------------|----------------|-----------------|
| 8" Outside Diameter  | .172"          | 0.188"          |
| 12" Outside Diameter | .188"          | 0.251"          |
| 16" Outside Diameter | .250"          | 0.282"          |
| 18" Outside Diameter | .250"          | 0.313"          |
| 20" Outside Diameter | .250"          | 0.344"          |
| 24" Outside Diameter | .250"          | 0.407"          |
| 30" Outside Diameter | .312"          | 0.470"          |
| 36" Outside Diameter | .375"          | 0.532"          |

### PART 3 - EXECUTION

#### 3.1 GENERAL

- A. Any solidification of embankments, boring headings, or tunnel headings or sides shall be the Contractor's responsibility and shall be done at his own expense.
- B. Bored installations shall have a bored-hole diameter essentially the same as the outside diameter of the casing pipe to be installed. Smooth wall new steel pipe meeting the required material standards shall be installed with suitable equipment providing a mechanically augered bore followed immediately by the casing pipe, without the use of water at any time during the work.
- C. The casing pipe shall be jacked into the boring as soon as possible after the boring is made. Lengths of casing pipe as long as practical shall be used. Joints between sections shall be completely welded as recommended for joining the particular type of pipe. Casing pipe installed shall be guided by a jacking frame and rails to maintain line and grade. Not more than 6 inches of excavation ahead of the casing pipe will be allowed during installation.
- D. Once the jacking procedure has begun, it should be continued without stopping until completed subject to weather and conditions beyond the control of the Contractor. Voids outside the jacked casing shall be filled with pumped cement grout, applied at a pressure of not less than 40 psi where an annular space between the casing and earth is established.

- E. Any replacement of carrier pipe in an existing casing shall be considered a new installation, subject to the applicable requirements of these Specifications.
- F. Open cut installations, where permitted, shall be in accordance with the details and procedures shown on the Drawings. For open cut installations, corrugated metal pipe may be substituted for casing pipe.
- G. Care shall be taken to ensure that casing pipe installed by boring and jacking or open cut method will be at the proper alignment and grade.
- H. The Contractor shall maintain and operate pumps, well points, and drainage system equipment to keep work dewatered at all times.
- I. Adequate sheeting, shoring, and bracing for embankments, operating pits, and other appurtenances shall be placed and maintained to ensure that work proceeds safely and expeditiously. Upon completion of the required work, the sheeting, shoring, and bracing shall be left in place, cut off, or removed, as designated by the Engineer.
- J. Trench excavation; all classes and types of excavation; the removal of rock, muck, debris; the excavation of all working pits; and backfill requirements of the section entitled "Earthwork" are included under this section.
- K. Carrier pipe installed in casing shall be as specified in the detailed plans or as required in the bid proposal.
- L. After the casing pipe is installed, the carrier pipe shall be installed exercising care at all times to protect the interior of the casing pipe and to maintain tight, full-seated joints in the carrier pipe. The carrier pipe shall be installed at the proper line and grade without any sags or high spots.
- M. The carrier pipe shall be held concentric with the casing pipe by the use of hardwood blocks spaced radially around the pipe and secured together so that they remain firmly in place. The spacing of such blocks longitudinally in the casing pipe shall not be greater than 10 feet.
- N. Casing pipe shall be sealed at the ends with an approved flexible material to prevent flowing water and debris from entering the annular space between the casing and the carrier pipe.

### 3.2 HIGHWAY AND RAILWAY CROSSINGS

- A. The Contractor shall be held responsible and accountable for the coordinating and scheduling of all construction work within the right-of-ways.

- B. Work along or across the right-of-way shall be under the supervision of the Engineer, state highway department engineer and the railroad engineer.
- C. All pipelines installed under paved roads and paved crossroads within the right-of-ways of the state highway department and railroads shall be encased. This includes, but is not limited to, all water and sewer service lines.
- D. For open trench cut installations, the Contractor shall make satisfactory arrangements to detour traffic around the area of highway where work is in progress, with minimum inconvenience placed on the traveling public. The Contractor shall provide suitable flagmen, watchmen, safety devices, and other services and facilities as may be required by the state highway department. The cost of the same shall be borne by the Contractor.
- E. All sewer lines shall have a minimum cover of 48 inches unless otherwise shown on the Drawings, but in no case shall the minimum cover be less than that required by the regulations of the agency involved.
- F. Unless otherwise shown, encasement shall extend 5 feet beyond the embankment or back of side ditch. On curbed portions of conventional highways the casing pipe shall extend past the back of the curb or sidewalk.
- G. For open trench cut installations, the Contractor shall be responsible for scheduling and coordinating all construction work. All work at one particular crossing shall be completed with the trench backfilled, compacted, and a temporary crushed stone surface provided for traffic before any work is started another such crossing.
- H. All installations shall be done to leave free flows in drainage ditches, pipes, culverts, or other surface drainage facilities of the highway, street, or its connections.
- I. Where sodding is disturbed by excavation or backfilling operation, such areas shall be replaced by mulch sodding on slopes 5% or less. All slopes over 5% shall be replaced with block sodding. No separate payment shall be made for sodding which shall be included in the bid prices for installation of pipe.
- J. All trench excavation within the right-of-way, but not under pavement, shall be backfilled by tamping in 6 inch layers.
- K. All surplus materials shall be removed from the right-of-way and the excavation finished flush with surrounding ground.

- L. Grout backfill shall be used for unused holes or abandoned pipes.
- M. Boring, jacking, or driving of carrier or casing pipes under existing highways shall be accomplished without jetting, sluicing, or wetboring.
- N. No excavated material or equipment shall be placed on the pavement or shoulders of the highway without the express approval of the state highway department engineer.
- O. In no instance will the Contractor be permitted to leave equipment (trucks, backhoes, etc.) on the pavement or shoulder overnight. Construction materials to be installed which are placed on the right-of-way in advance of construction shall be placed in such a manner as not to interfere with the safe operation of the highway.
- P. The Contractor shall submit a Traffic Control Plan (TCP) in accordance with the manual for Uniform Traffic Control and Devices. The TCP shall be submitted to the highway division in which the project lies and it shall be approved prior to starting construction. The Contractor at all times shall comply with the TCP, MUTCD, and Utility Manual.

END OF SECTION 02951.